Geosyntec consultants

289 Great Road, Suite 105
Acton, Massachusetts 01720
PH 978.263.9588
FAX 978.263.9594
www.geosyntec.com

Memorandum

Date:	11 May 2011
To:	Joseph Lemay, United States Environmental Protection Agency
Copies to:	Clayton Smith, de maximis, inc.
From:	Todd Creamer, Geosyntec Consultants, Inc.
Subject:	Validated Results of Winter 2011 Commercial Sampling Event Wells G&H Superfund Site, Woburn, Massachusetts Alpha Analytical Laboratory Report: L1104363

This memorandum is a transmittal for validated data and associated information for the subject sampling event. Specifically, the attached information includes the Tier IV data validation report for twelve air samples, two field duplicate samples, and one trip blank collected on 31 March and 01 April 2011, sampling locations specified on attached Figure 1, field forms generated during the sampling event, and a tabulated summary of household chemicals observed during the building surveys prior to sampling. Raw, unvalidated data for this residential sampling event were transmitted to the USEPA via email on 25 April 2011.

* * * * *

Geosyntec consultants

2240 Sutherland Avenue, Suite 107
Knoxville, TN 37919
PH 865.330.0037
FAX 865.330.9949
www.geosyntec.com

Memorandum

Date: 25 April 2011

To: Todd Creamer

From: Mary Tyler

Copies to: Julia Caprio

Subject: Tier IV Data Validation Alpha Analytical Lab Number L1104363
Wells G&H Superfund Site, Woburn, Massachusetts

1. INTRODUCTION AND SUMMARY

This report summarizes the findings of a Tier IV data validation for twelve air samples, two field duplicate samples, and one trip blank collected on 31 March 2011 and 01 April 2011. These samples were collected as part of the Wells G&H Superfund Site Vapor Intrusion Assessment. Air samples were analyzed by Alpha Analytical (Mansfield, Massachusetts) using the following methods:

- EPA Modified Method TO-15 using Selected Ion Monitoring (SIM) - Volatile Organic Compounds (VOCs)
- EPA Modified Method TO-15 – Acetone and Ethyl Acetate
- Massachusetts DEP Method APH – Air-Phase Petroleum Hydrocarbons (APH)

All samples collected on 31 March 2011 and 01 April 2011, once received by the lab, were handled, prepared, and measured in the same manner under similar prescribed conditions.

Data for the organic compounds were reviewed based on guidance specified in the project-specific Quality Assurance Project Plan (QAPP) in Form F which lists the USEPA Region 2 Guidance document entitled USEPA Hazardous Water Support Branch: Validating Air Samples, Volatile Organic Analysis of Ambient Air in Canisters by Method TO-15 (SOP#HW-31, Revision #4, October 2006). Data for the organic compounds were also reviewed based on the pertinent methods referenced by the data package and professional judgment.

The following samples were analyzed and validated at a Tier IV level in the data set:

Lab ID	Client ID
L1104363-01	260407-OA1
L1104363-02	260407-OA2
L1104363-03	260407-17-IA1
L1104363-04	260407-22-IA1
L1104363-05	260407-22-IA2
L1104363-06	260407-20-IA1
L1104363-07	260407-19-IA1
L1104363-08	260407-17-SS1
L1104363-09	260407-22-SS1
L1104363-10	260407-22-SS2
L1104363-11	260407-20-SS1
L1104363-12	260407-19-SS1
L1104363-13	BD03-03312011
L1104363-14	BD04-04012011
L1104363-15	TB02-04012011

There were two copies of the chain of custody (COC) in the data package, the original COC and a revised COC. The revised COC requested analysis for acetone and ethyl acetate in addition to other compounds listed on the original COC. According to the Alpha Analytical Call Tracker Report form included in the data package, the client (Todd Creamer) requested the additional analyses on 07 April 2011 and sent the amended COC. The form also indicated that there was an identification (ID) discrepancy between the COC and the label for sample L1104363-03; the sample was identified on the COC as 260407-17-IA1 and on the label as 260407-17-IA2. According to the client, the correct client ID was 260407-17-IA1.

Review of the canister cleaning certification documentation included in the data package indicated the following:

- Acetone was detected at estimated concentrations greater than the method detection limit (MDL) and less than the reporting limit in the canisters used to collect samples 260407-OA2, 260407-17-IA1, 260407-20-IA1, 260407-22-SS1, 260407-22-SS2 and 260407-19-SS1. Since acetone was detected in these samples at concentrations above the reporting limit (RL), no qualifications were applied to the data based on professional judgment.

- The canisters used to collect samples BD03-03312011 and TB02-04012011 and the flow controller used to collect sample 260407-17-SS1 did not have certifications for acetone and ethyl acetate. No qualifications were applied to the data based on professional judgment.

The conclusion from the Tier IV data validation presented herein and covering the QC parameters listed below is that the data, as qualified, are usable for meeting the project objectives documented in Form D of the QAPP.

2. VOLATILE ORGANIC COMPOUND ANALYSIS (VOCs)

Twelve air samples, two field duplicate samples and one trip blank sample were analyzed for VOCs per EPA modified Method TO-15, using SIM and for acetone and ethyl acetate and a modified EPA Method TO-15.

Components of the laboratory data package that were reviewed during this Tier IV data validation are listed below. A check mark (✓) indicates components of the data package that are acceptable. A crossed circle (⊗) signifies components of the data package where issues were raised during the course of the validation review and these issues should be considered to determine whether they have an impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Instrument Performance Check
- ⊗ Initial Calibration
- ✓ Continuing Calibration Verification
- ⊗ Method Blanks
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Trip Blank
- ⊗ Field Duplicate
- ✓ Internal Standards
- ✓ Target Compound Identifications
- ⊗ Target Compound Quantitations
- ✓ Electronic Data Deliverables Review

2.1 Overall Assessment

The VOC data reported in this package are considered to be usable for meeting the project objectives documented in Form D of the QAPP. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

It was noted that for most analytes, reporting limit concentrations were the same as the method detection limit (MDL) concentrations. Review of the reporting limits and MDLs found that the proposed screening levels listed in the QAPP were met.

2.2 Holding Times

The holding time for an air sample collected in a Summa™ canister for TO-15 analysis is 30 days from sample collection. The holding times were met for the sample analyses.

2.3 Instrument Performance Check

Instrument performance check samples (tune standards) were analyzed by Alpha Analytical. All calibration standards, the air samples and QC samples were analyzed within 24-hours after analyzing the tune standards. All ion abundance criteria were met for the tune standard, bromofluorobenzene (BFB).

2.4 Initial Calibration

Appropriate initial calibrations were performed and documented for each analyte. The laboratory calculated percent relative standard deviations (%RSDs) of the relative response factors (RRFs). The %RSDs met the method criteria of less than or equal to 30%, and the minimum average RRFs were above the method criteria of 0.050, with the following exception. The %RSD for naphthalene was 44%. Therefore, the undetected concentrations of naphthalene were UJ qualified as estimated less than the MDL and the detected concentrations were J qualified as estimated. The concentrations of naphthalene in samples 260407-17-IA1, 260407-22-IA1, 260407-22-IA2, 260407-20-IA1, 260407-19-IA1, 260407-17-SS1, 260407-22-SS1, 260407-22-SS2 and BD03-03312011 were U qualified as estimated less than the RL due to method blank contamination (see Section 2.6 below); therefore, based on professional judgment, no additional qualifications were made to these samples due to the initial calibration result outside of the validation criteria. The qualifications applied to the samples are summarized below.

Sample ID	Compound	Laboratory Concentration ($\mu g/m^3$)	Validation Concentration ($\mu g/ m^3$)	EDD Reason Code
260407-OA1	Naphthalene	0.131 U	0.131 UJ	9
260407-OA2	Naphthalene	0.131 U	0.131 UJ	9
260407-20-SS1	Naphthalene	1.2	1.20 J	9
260407-19-SS1	Naphthalene	2.03	2.03 J	9
BD04-04012011	Naphthalene	2.7	2.70 J	9
TB02-04012011	Naphthalene	0.131 U	0.131 UJ	9

J - estimated concentration greater than the MDL and less than the reporting limit
U - not detected at the stated MDL

An initial calibration verification (ICV) standard was analyzed after the initial calibration. The ICV RRFs met the method minimum RRF criteria of 0.050. The percent differences (%Ds) between the RRFs in the initial calibration and the ICV were within the method acceptance criteria of less than or equal to 30%, with the following exception. The %D for trans-1,3-dichloropropene was 33%. Based on professional judgment, no qualifications were applied to the data due to the ICV %D result for trans-1,3-dichloropropene since the continuing calibration verification standards %Ds and the LCS recoveries for trans-1,3-dichloropropene, analyzed on the same days as the samples, were within the method acceptance limits.

2.5 Continuing Calibration Verification (CCV)

CCVs were performed after the initial calibration on a daily basis after the BFB tune and prior to the analyses of samples. The CCVs RRFs met the method minimum RRF criteria of 0.050. The %Ds between the RRFs in the initial calibration and CCVs were within the method acceptance criteria of less than or equal to 30%.

2.6 Method Blanks

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (i.e., one per batch of 20 samples). Three method blanks were analyzed and reported for the 15 samples. VOCs were not detected in the method blanks above the MDLs, with the exception of naphthalene in batch WG461822-4, which is associated with the samples qualified below. Naphthalene was detected in the method blank at an estimated concentration of 0.152 µg/m^3, which is greater than the MDL and less than the reporting limit. Therefore, the estimated concentrations greater than the MDL and less than the reporting limit in the samples associated with this method blank were U qualified as not detected at the reporting limit. Concentrations less than five times the blank concentration were U qualified as not detected at the reported concentrations.

Samples qualified based on data for the method blank are summarized below.

Sample ID	Compound	Laboratory Concentration (µg/m^3)	Validation Concentration (µg/ m^3)	EDD Reason Code
260407-17-IA1	Naphthalene	0.320	0.320 U	3
260407-22-IA1	Naphthalene	0.382	0.382 U	3
260407-22-IA2	Naphthalene	0.393	0.393 U	3
260407-20-IA1	Naphthalene	0.445	0.445 U	3
260407-19-IA1	Naphthalene	0.581	0.581 U	3
260407-17-SS1	Naphthalene	0.498	0.498 U	3
260407-22-SS1	Naphthalene	0.733	0.733 U	3
260407-22-SS2	Naphthalene	0.215 J	0.262 U	3
BD03-03312011	Naphthalene	0.592	0.592 U	3

J - estimated concentration greater than the MDL and less than the reporting limit
U - not detected at the reported concentration

2.7 Laboratory Duplicate

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One laboratory duplicate was analyzed, using sample 260407-22-IA1. The results for the laboratory duplicate were within the method-specified acceptance criteria for VOCs of 25% D.

2.8 Laboratory Control Sample

Three laboratory control sample (LCSs) were analyzed for the 15 samples submitted, which satisfies the minimum frequency for the number and types of samples analyzed (one per batch of 20 samples). The results for the LCSs were within the method-specified acceptance criteria for recovery of 70-130%.

2.9 Trip Blank

A trip blank, TB02-04012011, accompanied the sample shipment. No VOCs were detected in the trip blank above the MDL.

2.10 Field Duplicate

Two field duplicate samples, BD03-03312011 and BD04-04012011, were collected with the samples. Acceptable precision (RPD $\leq$25%) was demonstrated between each field duplicate and the associated original samples, 26070-17-SS1 and 260704-19-SS1, respectively, with the following exceptions:

- Ethyl acetate and bromoform were detected above the reporting limits in the field duplicate sample and not detected above the MDL in the original sample for the duplicate pair 26070-17-SS1/BD03-03312011, resulting in non-calculable and unacceptable RPDs between the results.
- Carbon tetrachloride and methylene chloride were detected above the reporting limits in the original sample and not detected above the MDL in the field duplicate sample for the duplicate pair 260704-19-SS1/BD04-04012011, resulting in non-calculable and unacceptable RPDs between the results.
- The RPDs were greater than 25% for 1,2,4-trimethylbenzene, naphthalene and tetrachloroethene in the duplicate pair 260704-19-SS1/BD04-04012011.

As a result of these analyses for duplicate samples, the detected concentrations of ethyl acetate, bromoform, carbon tetrachloride, methylene chloride, 1,2,4-trimethylbenzene, naphthalene and tetrachloroethene were J qualified as estimated and the undetected concentrations of ethyl acetate, bromoform, carbon tetrachloride and methylene chloride were UJ qualified as estimated less than the MDL in the duplicate pairs. The calculated RPDs of the duplicate pairs and applicable qualifications are summarized below.

Sample ID		Laboratory Concentration (µg/m3)	RPD	Validation Concentration (µg/ m3)	EDD Reason Code
260407-17-SS1	Acetone	1070	25	NA	NA
BD03-03312011	Acetone	1380		NA	NA
260407-17-SS1	Ethyl Acetate	0.544 U	NC	0.544 UJ	7
BD03-03312011	Ethyl Acetate	2.31		2.31 J	7
260407-17-SS1	1,1,1-Trichloroethane	0.365	0	NA	NA
BD03-03312011	1,1,1-Trichloroethane	0.365		NA	NA
260407-17-SS1	1,2,4-Trimethylbenzene	0.246	4	NA	NA
BD03-03312011	1,2,4-Trimethylbenzene	0.255		NA	NA
260407-17-SS1	Bromoform	0.206 U	NC	0.206 UJ	7
BD03-03312011	Bromoform	0.320		0.320 J	7
260407-17-SS1	Carbon tetrachloride	0.408	2	NA	NA
BD03-03312011	Carbon tetrachloride	0.415		NA	NA
260407-17-SS1	Chloroform	0.220	0	NA	NA
BD03-03312011	Chloroform	0.220		NA	NA
260407-17-SS1	Ethylbenzene	0.104	19	NA	NA
BD03-03312011	Ethylbenzene	0.126		NA	NA
260407-17-SS1	Naphthalene	0.498	17	NA	NA
BD03-03312011	Naphthalene	0.592		NA	NA
260407-17-SS1	Tetrachloroethene	4.45	22	NA	NA
BD03-03312011	Tetrachloroethene	5.54		NA	NA
260407-17-SS1	Toluene	2.59	6	NA	NA
BD03-03312011	Toluene	2.75		NA	NA
260407-17-SS1	Total Xylenes	0.547	3	NA	NA
BD03-03312011	Total Xylenes	0.564		NA	NA
260407-17-SS1	All other VOCs	ND	0	NA	NA
BD03-03312011	All other VOCs	ND		NA	NA
260407-19-SS1	Acetone	76	17	NA	NA
BD04-04012011	Acetone	90.4		NA	NA
260407-19-SS1	1,1,1-Trichloroethane	3.97	25	NA	NA
BD04-04012011	1,1,1-Trichloroethane	5.08		NA	NA
260407-19-SS1	1,2,4-Trimethylbenzene	1.53	26	1.53 J	7
BD04-04012011	1,2,4-Trimethylbenzene	1.98		1.98 J	7
260407-19-SS1	1,3-Butadiene	0.046	6	NA	NA
BD04-04012011	1,3-Butadiene	0.049		NA	NA
260407-19-SS1	1,4-Dichlorobenzene	0.450	22	NA	NA
BD04-04012011	1,4-Dichlorobenzene	0.559		NA	NA
260407-19-SS1	Benzene	0.421	7	NA	NA
BD04-04012011	Benzene	0.453		NA	NA

Sample ID		Laboratory Concentration (µg/m3)	RPD	Validation Concentration (µg/ m3)	EDD Reason Code
260407-19-SS1	Carbon tetrachloride	0.176	NC	0.176 J	7
BD04-04012011	Carbon tetrachloride	0.126 U		0.126 UJ	7
260407-19-SS1	Chloroform	1.46	24	NA	NA
BD04-04012011	Chloroform	1.86		NA	NA
260407-19-SS1	Ethylbenzene	2.38	22	NA	NA
BD04-04012011	Ethylbenzene	2.98		NA	NA
260407-19-SS1	Methylene chloride	14.4	NC	14.4 J	7
BD04-04012011	Methylene chloride	1.74 U		1.74 UJ	7
260407-19-SS1	Naphthalene	2.03	28	2.03 J	7
BD04-04012011	Naphthalene	2.70		2.70 J	7
260407-19-SS1	Tetrachloroethene	12.9	26	12.9 J	7
BD04-04012011	Tetrachloroethene	16.7		16.7 J	7
260407-19-SS1	Toluene	1.16	23	NA	NA
BD04-04012011	Toluene	1.46		NA	NA
260407-19-SS1	Trichloroethene	0.150	17	NA	NA
BD04-04012011	Trichloroethene	0.177		NA	NA
260407-19-SS1	Total Xylenes	17.0	22	NA	NA
BD04-04012011	Total Xylenes	21.2		NA	NA
260407-19-SS1	The other VOCs	ND	0	NA	NA
BD04-04012011	The other VOCs	ND		NA	NA

U - not detected at the reported MDL
ND - not detected at the MDL
J - estimated concentration greater than the MDL and less than the reporting limit
NC - not calculable
NA - not applicable
* - no additional qualifications applied to the data based on the field duplicate results; results qualified due to method blank contamination

2.11 Internal Standards

The internal standard areas and retention times (RTs) were within method limits of ±40% of the internal standard areas from the most recent calibration and within 0.33 minutes of the retention times for the internal standards from the most recent calibration.

2.12 Target Compound Identifications

The target compound identifications were within the validation criteria.

2.13 Target Compound Quantitations

The compound quantitations were within the validation criteria with the one sample exception noted below.

According to the report narrative, the concentration of acetone in sample 260407-19-IA1 should be considered estimated due to coelution of acetone with a non-target peak. Therefore, the concentration of acetone in sample 260407-19-IA1 was J qualified as estimated. This qualification is summarized below.

Sample ID	Compound	Laboratory Concentration (µg/m3)	Validation Concentration (µg/m3)	EDD Reason Code
260407-19-IA1	Acetone	55.6	55.6 J	13

2.14 Electronic Data Deliverables Review

A minimum of 20% of the results and all sample IDs provided in the electronic data deliverable (EDD) were reviewed against information provided in the Level IV report. No discrepancies were identified between the EDD and the Level IV report.

3. AIR PHASE PETROLEUM HYDROCARBONS (APH)

Twelve air samples, two field duplicate samples and one trip blank sample were analyzed for petroleum hydrocarbons per Massachusetts DEP Method APH.

Components of the laboratory data package that were reviewed during this Tier IV data validation are listed below. A check mark (✓) indicates components of the data package that are acceptable. A crossed circle (⊗) signifies components of the data package where issues were raised during the course of the validation review, and these issues should be considered to determine whether they have an impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Instrument Performance Check
- ✓ Initial Calibration
- ✓ Continuing Calibration Verification
- ✓ Method Blanks
- ✓ Laboratory Control Sample
- ⊗ Laboratory Duplicate
- ⊗ Trip Blank
- ⊗ Field Duplicate
- ✓ Internal Standards
- ✓ Target Compound Identifications
- ✓ Target Compound Quantitations
- ✓ Electronic Data Deliverables Review

3.1 Overall Assessment

The APH data reported in this package are considered to be usable for meeting the project objectives documented in Form D of the QAPP. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

3.2 Holding Times

The holding time for an air sample collected in a Summa™ canister for APH analysis is 30 days from sample collection. The holding times were met for the sample analyses.

3.3 Instrument Performance Check

Instrument performance check samples (tune standards) were analyzed by Alpha Analytical. All calibration standards, the air samples and QC samples were analyzed within 24-hours after analyzing the tune standards. All ion abundance criteria were met for bromofluorobenzene (BFB).

3.4 Initial Calibration

Appropriate initial calibrations were performed and documented for each analyte. The laboratory calculated %RSDs of the RRFs. The %RSDs met the method criteria of less than or equal to 30% for all compounds except naphthalene, which has a %RSD criteria of less than or equal to 40%.

3.5 Continuing Calibration Verification (CCV)

CCVs were performed after the initial calibration on a daily basis after the BFB tune and prior to the analysis of samples. The CCVs RRFs met the method minimum RRF criteria of 0.050. The %Ds between the RRFs in the initial and CCVs were within the method acceptance criteria of less than or equal to 30%.

3.6 Method Blanks

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (i.e., one per batch of 20 samples). One method blank was analyzed and reported for the 15 samples. APH were not detected in the method blank above the reporting limits.

3.7 Laboratory Duplicate

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One laboratory duplicate was analyzed, using sample 260407-22-IA1. The results for the laboratory duplicate were within the method-specified acceptance criteria for APH analytes of 25%D, with the following exception:

- C9-C10 Aromatics were detected in sample 260407-22-IA1 above the reporting limit and not detected in the laboratory duplicate, resulting in a non-calculable and unacceptable

RPD between the results. Therefore, the detected concentration C9-C10 Aromatics in sample 260407-22-IA1 was J qualified as estimated. This qualification is summarized below.

Sample ID	Compound	Laboratory Concentration (µg/m^3)	Validation Concentration (µg/ m^3)	EDD Reason Code
260407-22-IA1	C9-C10 Aromatics	10	10 J	12

3.8 Laboratory Control Sample

One LCS was analyzed for the 15 samples submitted to the laboratory, which is the proper frequency for the number and types of samples analyzed (i.e., one per batch of 20 samples). The results for the LCS were within the method-specified acceptance criteria for recovery of 70-130%.

3.9 Trip Blank

A trip blank, TB01-03182011, accompanied the sample shipment. No APH were detected in the trip blank above the reporting limits, with the exception of C5-C8 Aliphatics, which were detected at a concentration of 12.0 µg/m^3. Therefore, based on professional judgment, the concentration of C5-C8 Aliphatics in sample 260407-22-SS2 was U qualified as not detected at the reported concentration since the concentration was less than five times the trip blank concentration.

Sample ID	Compound	Laboratory Concentration (µg/m^3)	Validation Concentration (µg/ m^3)	EDD Reason Code
260407-22-SS2	C5-C8 Aliphatics, Adjusted	58	58 U	3

3.10 Field Duplicate

Two field duplicate samples, BD03-03312011 and BD04-04012011, were collected with the samples. Acceptable precision (RPD $\leq$25%) was demonstrated between each field duplicate and the associated original samples, 26070-17-SS1 and 260704-19-SS1, respectively, with the exceptions of C5-C8 Aliphatics, C9-C10 Aromatics, C9-C12 Aliphatics and naphthalene in the duplicate pair 260704-19-SS1/BD04-04012011. Therefore the concentrations of C5-C8 Aliphatics, C9-C10 Aromatics, C9-C12 Aliphatics and naphthalene are J qualified as estimated in the duplicate pair 260704-19-SS1/BD04-04012011.

The calculated RPDs of the duplicate pair and applicable qualifications are summarized below.

Sample ID	Compound	Laboratory Concentration (µg/m^3)	RPD	Validation Concentration (µg/ m^3)	EDD Reason Code
260407-17-SS1	C5-C8 Aliphatics, Adjusted	200	5	NA	NA
BD03-03312011	C5-C8 Aliphatics, Adjusted	190		NA	NA
260407-17-SS1	C9-C12 Aliphatics, Adjusted	18	11	NA	NA
BD03-03312011	C9-C12 Aliphatics, Adjusted	20		NA	NA
260407-17-SS1	Toluene	3.1	9	NA	NA
BD03-03312011	Toluene	3.4		NA	NA
260407-17-SS1	All other APH	ND	0	NA	NA
BD03-03312011	All other APH	ND		NA	NA
260407-19-SS1	C5-C8 Aliphatics, Adjusted	230	26	230 J	7
BD04-04012011	C5-C8 Aliphatics, Adjusted	300		300 J	7
260407-19-SS1	C9-C10 Aromatics Total	13	32	13 J	7
BD04-04012011	C9-C10 Aromatics Total	18		18 J	7
260407-19-SS1	C9-C12 Aliphatics, Adjusted	310	30	310 J	7
BD04-04012011	C9-C12 Aliphatics, Adjusted	420		420 J	7
260407-19-SS1	Ethylbenzene	2.6	14	NA	NA
BD04-04012011	Ethylbenzene	3.0		NA	NA
260407-19-SS1	Naphthalene	2.5	28	2.5 J	7
BD04-04012011	Naphthalene	3.3		3.3 J	7
260407-19-SS1	o-Xylene	4.6	23	NA	NA
BD04-04012011	o-Xylene	5.8		NA	NA
260407-19-SS1	p/m-Xylene	13	14	NA	NA
BD04-04012011	p/m-Xylene	15		NA	NA
260407-17-SS1	All other APH	ND	0	NA	NA
BD03-03312011	All other APH	ND		NA	NA

U - not detected at the indicated reporting limit
ND - not detected at the reporting limit

3.11 Internal Standards

The internal standard areas and retention times were within method limits of ±40% of the internal standard areas from the most recent calibration and within 0.33 minutes of the retention times for the internal standards from the most recent calibration.

3.12 Target Compound Identifications

The target compound identifications were within the validation criteria.

3.13 Target Compound Quantitations

The compound quantitations were within the validation.

3.14 Electronic Data Deliverables Review

A minimum of 20% of the results and all sample IDs provided in the EDD were reviewed against the information provided in the Level IV report. No discrepancies were identified between the EDD and the Level IV report.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher that the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower that the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

			Standards			Indoor Air					Outdoor Air	
Method Group	Parameter	Units	MADEP TIAC 90%	EPA RSL Residential Air	MADEP IA Threshold	260407-17-IA1-3/31/2011	260407-19-IA1-3/31/2011	260407-20-IA1-3/31/2011	260407-22-IA1-3/31/2011	260407-22-IA2-3/31/2011	260407-OA1-3/31/2011	260407-OA2-3/31/2011
APH												
	Adjusted C5-C8 Aliphatics	µg/m3				2,200	130	1,000	160	180	<12	<12
	Adjusted C9-C12 Aliphatics	µg/m3				460	120	99	140	200	<14	<14
	Aromatics C9-C10	µg/m3	44		10	14	14	15	10J	<10	<10	<10
	Benzene	µg/m3	11	1.6	2.3	<2	<2	<2	<2	<2	<2	<2
	Butadiene	µg/m3		0.41		<2	<2	<2	<2	<2	<2	<2
	Ethyl benzene	µg/m3	7.4	4.9	7.4	<2	<2	<2	<2	<2	<2	<2
	m&p-Xylene	µg/m3				<4	<4	5.2	5.1	4.6	<4	<4
	Methyl tert-butyl ether (MTBE)	µg/m3	39	47	39	<2	<2	<2	<2	<2	<2	<2
	Naphthalene	µg/m3	2.7	0.36	0.61	<2	<2	<2	<2	<2	<2	<2
	o-Xylene	µg/m3		3100		<2	<2	<2	<2	<2	<2	<2
	Toluene	µg/m3	54	22000	54	71	11	58	23	23	<2	<2
Volatile Organic Compounds												
	1,1,1-Trichloroethane	µg/m3	3	22000	3	0.153	<0.109	0.174	<0.109	<0.109	<0.109	<0.109
	1,1,2-Trichloroethane	µg/m3	0	0.77	0.15	<0.109	<0.109	<0.109	<0.109	<0.109	<0.109	<0.109
	1,1-Dichloroethane	µg/m3	0	7.7	0.8	<0.081	<0.081	<0.081	<0.081	<0.081	<0.081	<0.081
	1,1-Dichloroethene	µg/m3	0	880	0.8	<0.079	<0.079	<0.079	<0.079	<0.079	<0.079	<0.079
	1,2,4-Trimethylbenzene	µg/m3		31		0.668	1.94	1	1.16	1.1	0.138	0.113
	1,2-Dichloroethane	µg/m3	0	0.47	0.09	0.408	0.214	9.52	0.489	0.437	<0.081	<0.081
	1,2-Dichloropropane	µg/m3	0	1.2	0.13	<0.092	<0.092	<0.092	<0.092	<0.092	<0.092	<0.092
	1,3-Dichlorobenzene	µg/m3	0.6		0.6	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
	1,4-Dichlorobenzene	µg/m3	1.5	1.1	0.5	<0.12	1.15	<0.12	<0.12	<0.12	<0.12	<0.12
	Acetone	µg/m3	91	140000	91	3,480	55.6J	89.8	128	1,050	6	4.95
	Benzene	µg/m3	11	1.6	2.3	0.769	0.935	0.938	0.718	0.766	0.562	0.46
	Bromodichloromethane	µg/m3	0	0.33	0.14	<0.134	<0.134	<0.134	<0.134	<0.134	<0.134	<0.134
	Bromoform	µg/m3	0	11	2.2	<0.206	<0.206	<0.206	<0.206	<0.206	<0.206	<0.206
	Butadiene	µg/m3		0.41		0.115	0.21	0.128	<0.044	<0.044	0.077	0.044
	Carbon tetrachloride	µg/m3	0.86	2	0.54	0.647	0.478	0.515	0.484	0.471	0.497	0.471
	Chlorobenzene	µg/m3	0	220	2.3	<0.092	0.202	<0.092	<0.092	0.097	<0.092	<0.092
	Chloroform	µg/m3	3	0.53	1.9	0.337	0.185	0.629	1.1	63.2	<0.098	<0.098
	cis-1,2-Dichloroethene	µg/m3	0		0.8	<0.079	<0.079	<0.079	<0.079	<0.079	<0.079	<0.079
	Dichloromethane (Methylene chloride)	µg/m3	11	26	5	<1.74	<1.74	<1.74	<1.74	<1.74	1.96	<1.74
	Ethyl acetate	µg/m3				367	4.84	22.2	10.5	9.24	<1.8	<1.8
	Ethyl benzene	µg/m3	7.4	4.9	7.4	0.928	1.23	1.46	1.34	1.24	0.13	0.1
	Ethylene dibromide	µg/m3	0	0.02	0.011	<0.154	<0.154	<0.154	<0.154	<0.154	<0.154	<0.154
	Isopropylbenzene	µg/m3		1800		<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46
	Methyl tert-butyl ether (MTBE)	µg/m3	39	47	39	<0.072	<0.072	<0.072	<0.072	<0.072	<0.072	<0.072
	Naphthalene	µg/m3	2.7	0.36	0.61	<0.32	<0.581	<0.445	<0.382	<0.393	<0.131	<0.131
	Tetrachloroethene	µg/m3	4.1	2.1	1.4	0.352	0.149	0.488	0.454	0.63	<0.136	<0.136
	Toluene	µg/m3	54	22000	54	64.5	10	53.6	21.5	21.7	0.757	0.621
	trans-1,2-Dichloroethene	µg/m3	0	260	0.8	<0.079	<0.079	<0.079	<0.079	<0.079	<0.079	<0.079
	trans-1,3-Dichloropropene	µg/m3	0		0.6	<0.091	<0.091	<0.091	<0.091	<0.091	<0.091	<0.091
	Trichloroethene	µg/m3	0.8	6.1	0.8	<0.107	<0.107	<0.107	<0.107	<0.107	<0.107	<0.107
	Vinyl Chloride	µg/m3	0	2.8	0.27	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051
	Xylenes (Total)	µg/m3	28	440	20	4.24	4.95	6.94	6.76	6.17	0.499	0.369

Notes: < = Not detected, less than laboratory reporting limit.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Method Group	Parameter	Units	Sub-Slab Soil Gas						
			260407-17-SS1-3/31/2011	260407-19-SS1-4/1/2011	260407-20-SS1-3/31/2011	260407-22-SS1-4/1/2011	260407-22-SS2-4/1/2011	BD03-3/31/2011	BD04-4/1/2011
APH									
	Adjusted C5-C8 Aliphatics	µg/m3	200	230J	90	140	<58	190	300J
	Adjusted C9-C12 Aliphatics	µg/m3	18	310J	120	1,300	<14	20	420J
	Aromatics C9-C10	µg/m3	<10	13J	19	14	<10	<10	18J
	Benzene	µg/m3	<2	<2	<2	<2	<2	<2	<2
	Butadiene	µg/m3	<2	<2	<2	<2	<2	<2	<2
	Ethyl benzene	µg/m3	<2	2.6	36	<2	2.8	<2	3
	m&p-Xylene	µg/m3	<4	13	180	<4	14	<4	15
	Methyl tert-butyl ether (MTBE)	µg/m3	<2	<2	<2	<2	<2	<2	<2
	Naphthalene	µg/m3	<2	2.5J	<2	<2	<2	<2	3.3J
	o-Xylene	µg/m3	<2	4.6	140	<2	14	<2	5.8
	Toluene	µg/m3	3.1	<2	3	<2	<2	3.4	<2
Volatile Organic Compounds									
	1,1,1-Trichloroethane	µg/m3	0.365	3.97	4.18	0.469	1.48	0.365	5.08
	1,1,2-Trichloroethane	µg/m3	<0.109	<0.109	<0.109	<0.109	<0.109	<0.109	<0.109
	1,1-Dichloroethane	µg/m3	<0.081	<0.081	<0.081	<0.081	<0.081	<0.081	<0.081
	1,1-Dichloroethene	µg/m3	<0.079	<0.079	<0.079	<0.079	<0.079	<0.079	<0.079
	1,2,4-Trimethylbenzene	µg/m3	0.246	1.53J	3.46	0.55	0.265	0.255	1.98J
	1,2-Dichloroethane	µg/m3	<0.081	<0.081	0.271	<0.081	<0.081	<0.081	<0.081
	1,2-Dichloropropane	µg/m3	<0.092	<0.092	<0.092	<0.092	<0.092	<0.092	<0.092
	1,3-Dichlorobenzene	µg/m3	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
	1,4-Dichlorobenzene	µg/m3	<0.12	0.45	0.222	0.12	<0.12	<0.12	0.559
	Acetone	µg/m3	1,070	76	167	95.6	140	1,380	90.4
	Benzene	µg/m3	<0.223	0.421	0.677	0.348	<0.223	<0.223	0.453
	Bromodichloromethane	µg/m3	<0.134	<0.134	<0.134	<0.134	<0.134	<0.134	<0.134
	Bromoform	µg/m3	<0.206	<0.206	<0.206	<0.206	<0.206	0.32J	<0.206
	Butadiene	µg/m3	<0.044	0.046	0.214	<0.044	<0.044	<0.044	0.049
	Carbon tetrachloride	µg/m3	0.408	0.176J	0.163	0.295	0.308	0.415	<0.126
	Chlorobenzene	µg/m3	<0.092	<0.092	<0.092	<0.092	<0.092	<0.092	<0.092
	Chloroform	µg/m3	0.22	1.46	1.91	<0.098	0.161	0.22	1.86
	cis-1,2-Dichloroethene	µg/m3	<0.079	<0.079	<0.079	<0.079	<0.079	<0.079	<0.079
	Dichloromethane (Methylene chloride)	µg/m3	<1.74	14.4J	4.46	17	10.3	<1.74	<1.74
	Ethyl acetate	µg/m3	<1.8	<1.8	<1.8	<1.8	<1.8	2.31J	<1.8
	Ethyl benzene	µg/m3	0.104	2.38	35	0.178	2.7	0.126	2.98
	Ethylene dibromide	µg/m3	<0.154	<0.154	<0.154	<0.154	<0.154	<0.154	<0.154
	Isopropylbenzene	µg/m3	<2.46	<2.46	4.33	<2.46	<2.46	<2.46	<2.46
	Methyl tert-butyl ether (MTBE)	µg/m3	<0.072	<0.072	<0.072	<0.072	<0.072	<0.072	<0.072
	Naphthalene	µg/m3	<0.498	2.03J	1.2J	<0.733	<0.215	<0.592	2.7J
	Tetrachloroethene	µg/m3	4.45	12.9J	19.2	80	2,310	5.54	16.7J
	Toluene	µg/m3	2.59	1.16	2.68	0.493	0.554	2.75	1.46
	trans-1,2-Dichloroethene	µg/m3	<0.079	<0.079	<0.079	<0.079	<0.079	<0.079	<0.079
	trans-1,3-Dichloropropene	µg/m3	<0.091	<0.091	<0.091	<0.091	<0.091	<0.091	<0.091
	Trichloroethene	µg/m3	<0.107	0.15	0.113	0.177	3.83	<0.107	0.177
	Vinyl Chloride	µg/m3	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051	<0.051
	Xylenes (Total)	µg/m3	0.547	17	321	1.08	27.8	0.564	21.2

Notes: < = Not detected, less than laboratory reporting limit.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

BD04-4/1/2011 is a blind duplicate of sample 260407-20-SS1

BD03-3/31/2011 is a blind duplicate of sample 260407-17-SS1

Attachment 4. Consumer Product Chemical Survey Summary, Commercial Structures
Wells G and H Superfund Site, Woburn, Massachusetts

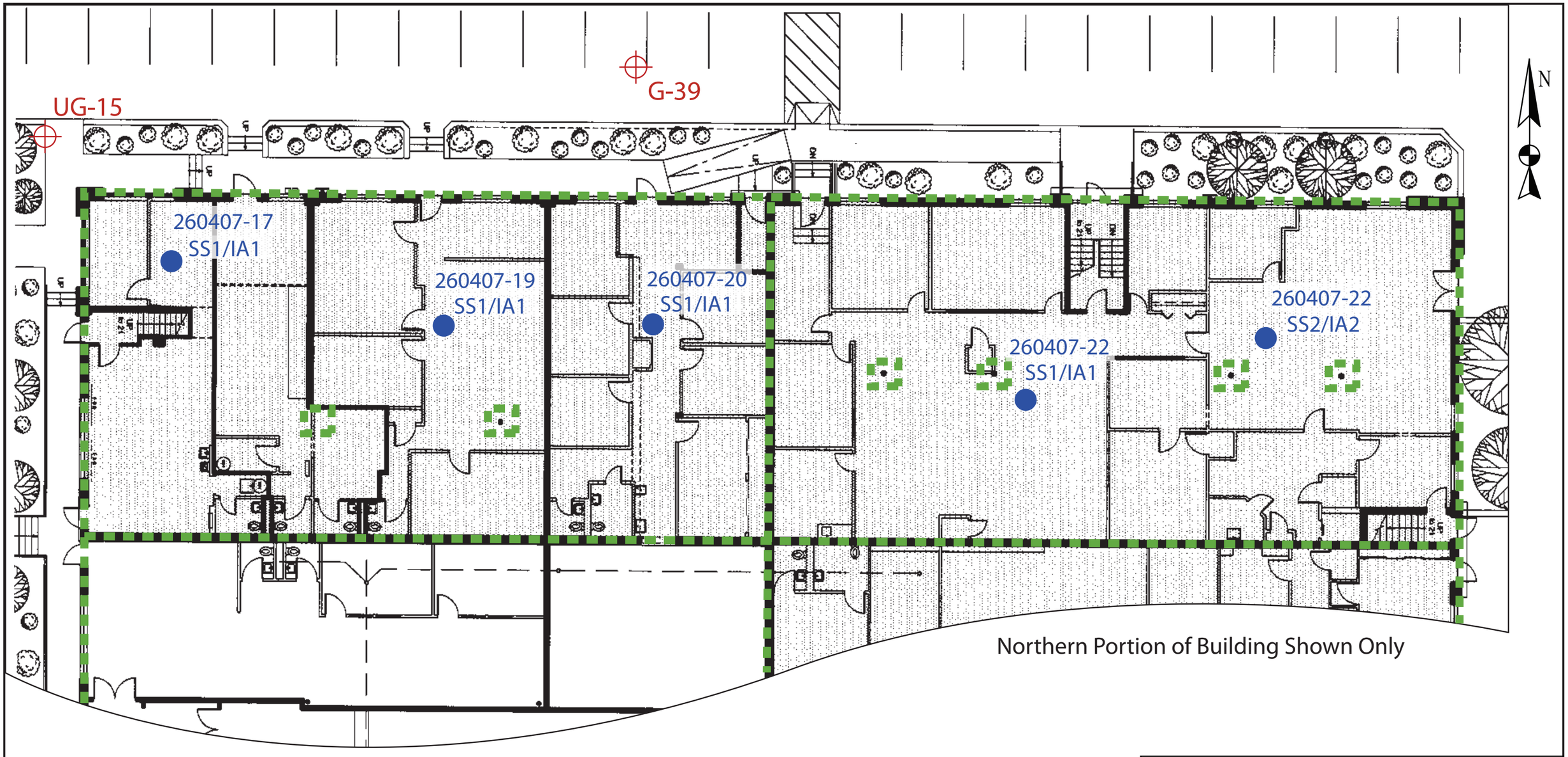
Product Identified During Building Survey	Known or Suspected to Contain Target Analytes
17 Cummings Park - Nail Gallery	
Divina Nail Polish Remover - Pure Acetone	-
Clorox Clean Up Cleaner with Bleach	-
Pink Paint	-
Divina Isopropyl Alcohol - 70% By Volume	-
Creative Nail Design, Inc Products	-
18 Cummings Park - Jillian's Hair Salon	
Various Hair Products	-
Matrix SoLite 20 Volume Developer	-
Olympic Premium 25-Year Premium Paint, Interior Latex Satin White	-
Americas Finest Interior Acrylic Latex Flat Wall Paint	-
19 Cummings Park - Time Communications	
Armor All On-The-Go Auto Glass Wipes	-
Monitor Wipes	-
Office Depot® Brand Cleaning Duster	-
Airwick Freshmatic Automatic Spray	-
Love My Carpet Pardon My Pet 2-in-1 Carpet & Room Deodorizer	-
Febreze Air Effects 9.7 oz	-
Ronsonol Lighter Fuel	Benzene, Aliphatics
Zippo Lighter Fluid	Aliphatics, BTX, Cyclohexane
Ronson MultiFill Butane Fuel	Aliphatic
20 Cummings Park - North Shore Spine & Rehab (Chiropractor)	
Darkroom chemicals	-
WD 40 Aerosol Lubricant	Petroleum
ALOE-SOUND LOTION	-
Diluted Alcohol for Cleaning/Sterilizing Purposes Only	-
22 Cummings Park - ProScience Analytical Services	
Febreze Air Effects 9.7 oz	-
Lysol Brand III Disinfectant Aerosol Spray, Early Morning Breeze	-
Hazardous Waste Sample Containers - Lead	-
Hazardous Waste Sample Containers - Hydrochloric Acid	-
Hazardous Waste Sample Containers - Nitric Acid	-
Acidified Rinse - Nitric Acid	-
Oxygen Canister	-
Acetylene Canister	C2 Aliphatic
1,1,2-Trichloro-1,2,2-Trifluoro-ethane	1,2,2-Trichloroethane
Ethyl Acetate	-
Methyl t-Butyl Ether	MTBE
Methanol	-
Hydrochloric Acid	-

Attachment 4. Consumer Product Chemical Survey Summary, Commercial Structures
Wells G and H Superfund Site, Woburn, Massachusetts

Product Identified During Building Survey	Known or Suspected to Contain Target Analytes
Acetone	-
Reagent Alcohol, 200 Proof	-
Polyvinyl Butyral	-
Chloroform	Chloroform
Dichloro-methane	-
Amyl Acetate	-
Chlorobenzene	Chlorobenzene
Pyridine	-
2,2,4-Trimethyl-pentane	C8 Aliphatic
darkroom related chemicals	-
DUST-OFF DUSTER	-
SoftGUARD Hand Cream	-

Notes:

- BTEX refers to the compounds benzene, toluene, ethylbenzene and xylenes collectively.



Monitoring Well

Co-located sub-slab soil gas and indoor air sampling location

Load-bearing structure with sub-surface footer

0 5′ 10′ 25′

Northern Portion of Basement Floor Plan
and Indoor Sampling Locations
Commercial Building

Wells G&H Superfund Site
Woburn, Massachusetts

Geosyntec consultants

ACTON, MASSACHUSETTS | FEBRUARY 2011

Figure 1

DAILY FIELD REPORT

Geosyntec consultants

www.geosyntec.com

Project Name: WR Grace VI Assessment | Date: 31 March 2011 | Page 1 of 3

Project Number: BR0200

Primary Activities: Summa Can Deployment For Indoor Air & Outdoor Air Sampling

Field Personnel: T. Creamer, C. Sullivan, S. Bruske

Recorded By:

Weather: 0900: overcast 39°F, calm/ENE @ 1mph

Time	Description of activities - location of work, work performed, equipment & personnel used, incidental information
0850	On site prepping equipment.
900	Meet w/ Charlie Foster from TRC (EPA oversight)
	Weather Readings 450 FT PER MINUTE From the
	EAST / NORTH EAST.
905	Craig on site to meet w/ Todd
	and talk through "Game plan"
910	Craig off site will return @ 930
910	Health & Safety Meeting Performed (See attached
	Sheet)
920	Sam Prepping Suma Cans (All cans from Alpha
	Labs 6 Liters)
920	Calibrate PPB Rae from Pine Env. (See attached
	Sheet)
930	Craig back on site w/ us.
	Walk the buildings w/ Todd to get sample
	ID.
	Sample IDs 260407 - OA1 - Rear center island play pole
	260407 - OA2 - Front tree
	260407 - 19 - IA1 - Time
	260407 - 20 - IA1 - CAS NSS
	260407 - 22 - IA1 - PS
945	Set 260407-OA2 on front tree intake is
	@ 48" PPB Rae Reads 0.0 Will open
	@ 950 Initial pressure Readings Documented
948	Set 260407-OA1 on Center Island Play Pole Intake is
	@ 38" From Ground. PPB Rae Reads = 0
949	Opened OA1
950	Opened OA2

DAILY FIELD REPORT

Geosyntec consultants
www.geosyntec.com

Project Name: Wells G & H
Project Number: BR0200
Field Personnel: C. Sullivan, S. Bancke, T. Creamer
Recorded By: C. Sullivan
Weather: Dec-CAST 40

Date: 3/11/2010 Page 2 of 3
Primary Activities: Air Sampling

Time	Description of activities - location of work, work performed, equipment & personnel used, incidental information
0940	Todd & Charlie & Craig over to Time Communication to set can. Scheduled opening
956	opened 260407 - 19 - IA-1 (-29.40)
1010	opened 260407 - 17 - IA-1
1015	opened 260407 - 20 - IA1 (-29.70)
1020	over to Lab to set 260407 - 22 - IA1 Set @ 44.5" Opened @ 1021 (-29.42)
	Setting 260407 - 22 - IA2 inside Lab. set @ 40" opened @ 1025 (-29.58)
1035	off Site will return @ 1700 for CAN Pick up
1700	C. Sullivan, S Bancke & T CREAMER ON Site. Checking OUTDOOR AIR CANS VACUUM
1715	Checking VACUUM on CANS FOR SUB SLAB Samples To Be Performed TONIGHT AND / OR TOMORROW
	CAN - 596 -29.57 initial VAC.
	CAN - 1640 -29.64 initial VAC.
	CAN - 744 -29.63 initial VAC.
	CAN - 1619 -29.64 initial VAC
1730	Craig on Site. weather reading 400 ft/s From East, 42° F, 29.85"
1742	Picked up [REDACTED] 260407-19 See other Sheet w/ Adjusted Data
1750	Picked up [REDACTED] 260407-20 (-6.33)
1752	~~Picked up~~ shut up [REDACTED] 260407-17 (-5.42) Pick up vacs
1757	Picked up [REDACTED] [REDACTED] 260407-22 (-5.85) IA-1
1800	Picked up [REDACTED] * 260407-22 (-2.70) DA-2
1805	Picked up DA-2 (Washington St side) (-2.38)
1807	Picked up DA-1 (Flag Pole Rear PL) (-7.90)

Daily Field Report

DAILY FIELD REPORT

Geosyntec consultants
www.geosyntec.com

Project Name: Wells G & H
Project Number: BR0200
Field Personnel: C. Sullivan, Sam Bouchike, T. Creager
Recorded By: C. Sullivan
Weather: Overcast 40

Date: 7/21/2011
Page 3 of 3
Primary Activities: Air Sampling

Time	Description of activities - location of work, work performed, equipment & personnel used, incidental information
1825	Penetrated the SLAB @ 20 Cummys
1835	Set Probe WITH Concrete
1840	Set equipment
1855	Performed leak Test. Leak Identified.
	Tightning Parts
1900	Retested. Well pressure @ 92 inches of
	water Opened Through CAN to top of
	Well. Held Steady Once equilibrated
	with Pressure @ 62 inches of WATER
1911	purge test passed, direct reading 100 ppm, shroud
	remeasured @ 11.9 % helium from tube
1918	canister opened
1935	drilled through @ 260704-17-SS1
1939	probe set @ 260407-17
2005	post sample purge @ 260407-80-SS1
2100	shut-in test @ 260407-17-SS1, purge passed (5:10)
2115	direct reading from tube @ 30% helium dropping
	from 2400 ppm, quickly
2115	opened canisters @ 260407 17-SS1 (-30.5)
2215	Shut Bom Cans - 2.63" of Hg.
2240	post sampling direct reading from tube, shroud @
	24%, 300 ppm
2315	Off Site

Daily Field Report

TAILGATE SAFETY MEETING REPORT

Geosyntec consultants
289 Great Road, Acton, MA 01720
Phone: 978-263-9588, Fax: 978-263-9594

Project Name:	Wells G & H	Date:	3/31/2011 Page 1 of 1
Project Number:	BR0200	Subcontractor:	NA
Field Personnel:	C. Sullivan S Bauske	City	WOBURN
(Geosyntec)		State	MA
Conducted By:	C. SULLIVAN	Weather:	OVERCAST 40°
Signature:	Chris Sullivan		

Work Summary

PLACING INDOOR AIR SUMMA CANS AS WELL AS AMBIENT OUT DOOR CANS. LATER IN DAY Collecting Sub SLAB Soil GAS Samples From INside Building.

Work Hazards

Slips / Trips / Falls, Active Parking lot, unknown work Spaces in occupied Building. Drilling later w/ Eye protection & Hand Tools.

Meeting started at:	910 (time)	Meeting ended at:	915 (time)

Name	Company	Signature
Chris Sullivan	Geosyntec	
Todd Creamer	Geosyntec	
Sam Bauske	Geosyntec	
Charlie Foster	TRC	

METER CALIBRATION

Geosyntec consultants
www.geosyntec.com

Project Name: Wells G & H Date: 3/31/2011 Recorded By: C. Sullivan Page 1 of 1

Project Number: BE0200 Weather: OVERCAST 40 PrimaryActivities: AIR & S.

PIDs

Serial Number		Ambient Air (ppm) (charcoal filter) 10PPM	100 ppm Isobutylene (ppm)
4151	Initial Time: 920	0.0	10.0 PPM
	Final Time:		
	Initial Time:		
	Final Time:		
	Initial Time:		
	Final Time:		
	Initial Time:		
	Final Time:		

GEMs

Serial Number		Ambient Air			Calibration Gas			Ambient Air		
		CH_4(%)	CO_2(%)	CH_4(%)	CO_2(%)	O_2(%)	O_2(%)	CH_4:(15%)	CO_2:(15%)	O_2:(0%)
	Initial Time:									
	Final Time:									
	Initial Time:									
	Final Time:									
	Initial Time:									
	Final Time:									
	Initial Time:									
	Final Time:									

NOTES:

Personnel Signature: [signature] Date: 3/31/2011

Meter Calibration.xls

SOIL GAS PROBE MEASUREMENTS

Geosyntec consultants

① Project Name: INF Group VI Assessment — Probe No.: 260407-20-SS1 — ☐ Sub-slab probe ☐ Soil gas probe
Date: 31 March 2011 — Project Number: BR0200 — Mini Rae 2000 Serial No.: N/A — Lamp: 10.6 / 11.7 eV
Site Location: 260407-20-SS1 — Landtech GEM 2000 Landfill Gas Meter Serial No. M: N/A
Weather: SEP DFR — MDG 2002 Helium detector Serial No.: RING 08228
Field Personnel: SWB, TC, GS — Tracer Gas: ☒ Helium ☐ Other Ltp
Recorded By: SWB

② Surface Type: ☐ Asphalt ☒ Concrete ☐ Grass ☐ Other ____
Surface Thickness (i.e., asphalt or concrete): (SWB) X 5 inches/centimeters ☐ Unknown

③ 1 Casing Volume
☐ Sub-slab <0.1 L
Soil gas probe 0.4 (L)

⑤ Shut in test prior to pneumatic test completed 62 in. H_2O held for 10 seconds.

⑥ Start of Pneumatic Test: N/A

Elapsed Time (min.)	Pump Flow Rate (LPM)	Well Head Vacuum in. H_2O
—	0.1	—
—	0.2	—
—	0.5	—
—		—

④ Initial Vacuum (prior to pumping) — in. H_2O

⑦ Field tubing blank reading (ppm_v) completed? ☐ Yes ☒ No PID Reading N/A ppm_v

⑧ Shut in test prior to purging completed? Yes ☒ No ☐

⑨ Purging

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L)	Purge Rate (LPM)	Cumulative Volume (L)	CH_4 (%)	CO_2 (%)	O_2 (%)	Tracer Gas: Shroud (%) Min	Tracer Gas: Shroud (%) Max	Tracer Gas: Sample (ppm_v / %) (circle one)	VOCs by PID (ppm_v)
3/31/2011	1909	1911	2.25	1	0.180	0.405	—	—	—	35	37	0	—
3/31/2011	2002	2005	3	1	0.160	0.500	—	—	—	23	16	0	—

Post sample screen

⑩ Helium concentration in field screened samples is less than 5% of minimum concentration in the shroud? ☒ Yes ☐ No **Note:** 1% helium = 10,000 ppm_v

⑪ Shut in test prior to sample collection completed? Yes ☒ No ☐

⑫ Sample Collection

Date	Time	Sample ID	Summa Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum (in. Hg)	Final Vacuum (in. Hg)
3/31/2011	1918	260407-20-SS1	1619	070	—	-29.64	-3.61

Comments:

SOP measurements - pneumatic testing.pdf

SOIL GAS PROBE MEASUREMENTS

Geosyntec consultants

① Project Name: WR Grace VI Assessment
Date: 31 March 2011 Project Number: _____
Site Location: 260407-17
Weather: see DFI
Field Personnel: SWB/CAS/TC
Recorded By: SWB

Probe No.: 260407-17-SS1 ☐ Sub-slab probe ☐ Soil gas probe
Mini Rae 2000 Serial No.: N/A Lamp: 10.6 / 11.7 eV
Landtech GEM 2000 Landfill Gas Meter Serial No. M: N/A
MDG 2002 Helium detector Serial No.: PINE: 08228
Tracer Gas: ☒ Helium ☐ Other UHP

② Surface Type: ☐ Asphalt ☒ Concrete ☐ Grass ☐ Other _____
Surface Thickness 5 (inches/centimeters) ☐ Unknown
(i.e., asphalt or concrete)

③ 1 Casing Volume
☐ Sub-slab <0.1 L
Soil gas probe 0.6 (L)

⑤ Shut in test prior to pneumatic test completed, 70 in. H_2O held for 10 seconds.

⑥ Start of Pneumatic Test: N/A

Elapsed Time (min.)	Pump Flow Rate (LPM)	Well Head Vacuum in. H_2O
–	0.1	–
–	0.2	–
–	0.5	–
–		–

④ Initial Vacuum (prior to pumping) +0.095 in. H_2O

⑦ Field tubing blank reading (ppm_v) completed? ☐ Yes ☒ No PID Reading N/A ppm_v

⑧ Shut in test prior to purging completed? Yes ☐ No ☐

⑨ Purging

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L)	Purge Rate (LPM)	Cumulative Volume (L)	CH_4 (%)	CO_2 (%)	O_2 (%)	Tracer Gas Shroud (%) Min	Tracer Gas Shroud (%) Max	Tracer Gas Sample (ppm_v, %) (circle one)	VOCs by PID (ppm_v)
3/31/11	2109	2112	3	1	0.200	0.600	–	–	–	36	41	O	–

⑩ Helium concentration in field screened samples is less than 5% of minimum concentration in the shroud? ☒ Yes ☐ No **Note:** 1% helium = 10,000 ppm_v

⑪ Shut in test prior to sample collection completed? Yes ☒ No ☐

⑫ Sample Collection

Date	Time	Sample ID	Summa Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum (in. Hg)	Final Vacuum (in. Hg)
3/31/11	2118	260407-17-SS1	596	0426		-29.57	
3/31/11	2118	BD03-03312011	1640	0426		-26.64	

Comments:

SGP measurements - pneumatic testing of

DAILY FIELD REPORT

Geosyntec consultants
www.geosyntec.com

Project Name: Wells G & H
Project Number: BROZOO
Field Personnel: C. Sullivan, Sam Baushke, & Todd Creamer
Recorded By: C. Sullivan
Weather: Rain / snow mix. 35°

Date: 4/1/2011 Page 1 of 2
Primary Activities: Sub SLAB Soil Gas Sampling

Time	Description of activities - location of work, work performed, equipment & personnel used, incidental information
0845	C. Sullivan & Sam Baushke & Todd Creamer on site.
	prepping Field work
	Sam checking pressures on cans & Recording
	initial Pressures.
0904	Craig on site talk game plan for todays
	work & yesterdays work
915	Setting up in 19.
925	Charlie Foster on site from TRL.
0928	started drilling @ 260407-19-SS1 vacuumed 5/8" before
0932	drilled through slab breaks through
0934	probe installed
0950	Probe set w/ Concrete
	Cleaning work Area & Setting up Connections
1035	to purge Cans
1100	drilled through @ 260407-20-SS1
1107	probe set
1117	drilled through @ 260407-20-SS2
1123	probe set
1142	260407-19-SS1 closed and BBOH
1150	Cleaning up & Packing Equipment @ 1st Location.
1215	out to Lunch.
	NOTE Please See other Field Forms For closing
	& Can Readings.
12.50	Back @ SS-3 Setting up Equipment
1300	Pressure test
1311	Opened CAN @ SS-3 (-29.32 initial Vac)
1318	While SumA Can Samples @ SS-3, Setting up
	other set up @ SS-4

Daily Field Report

DAILY FIELD REPORT

Geosyntec consultants
www.geosyntec.com

Project Name: Wells G&H
Project Number: BRO200
Field Personnel: C. SULLIVAN, S. BRIGHTLY, T. CREAMER.
Recorded By: C. Sullivan
Weather: RAIN 35° Cold

Date: 4/1/2011 Page 2 of 2
Primary Activities: Sub Slab Sampling.

Time	Description of activities - location of work, work performed, equipment & personnel used, incidental information
1350	Shut Can Final Vacuum Reading (-4.66)
1354	Performing ~~Vacuum~~ Helium Final Test.
1357	Shut in @ 260407-22-SS2, 62" H2O, 30s
1416	ethene purge passed, direct from tube, 125 ppm 31% in shroud
1419	opened can, gauge read -28.3
1451	Shut Gauge (-3.78 Vacuum Left) @ 260407-22-SS02
	Helium Check Performed on collection train. 17.2% in Shroud & 200 PPM in Line
1500	0.014" H2O differential pressure @ 260407-22-SS2
1525	Packing up & Heading off site

Daily Field Report

SOIL GAS PROBE MEASUREMENTS

Geosyntec consultants

① Project Name: WR Grace VI Assessment
Date: 1 April 2011 Project Number: ______
Site Location: 260407-19
Weather: See DFR
Field Personnel: SWB/CAS/TR
Recorded By: SWB

Probe No.: 260407-19-SS1 [X] Sub-slab probe [ ] Soil gas probe
Mini Rae 2000 Serial No.: N/T Lamp: 10.6 / 11.7 eV
Landtech GEM 2000 Landfill Gas Meter Serial No. M: N/P
MDG 2002 Helium detector Serial No.: DNF : 08228
Tracer Gas: [X] Helium [ ] Other UHP

② Surface Type: [ ] Asphalt [X] Concrete [ ] Grass [ ] Other______
Surface Thickness 5 (inches)/centimeters [ ] Unknown
(i.e., asphalt or concrete)

③ 1 Casing Volume
[ ] Sub-slab <0.1 L
Soil gas probe 0.5 (L)

④ Initial Vacuum (prior to pumping) 0 in. H_2O

⑤ Shut in test prior to pneumatic test completed 32 in. H_2O held for 10 seconds.

⑥ Start of Pneumatic Test: N/A

Elapsed Time (min.)	Pump Flow Rate (LPM)	Well Head Vacuum in. H_2O
-	0.1	-
-	0.2	-
-	0.5	-
-		-

⑦ Field tubing blank reading (ppm_v) completed? [ ] Yes [X] No PID Reading — ppm_v

⑧ Shut in test prior to purging completed? Yes [X] No [ ]

⑨ Purging

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L)	Purge Rate (LPM)	Cumulative Volume (L)	CH_4 (%)	CO_2 (%)	O_2 (%)	Tracer Gas Shroud (%) Min	Tracer Gas Shroud (%) Max	Tracer Gas Sample (ppm_v, %) (circle one)	VOCs by PID (ppm_v)
4/1/2011	1027	1030	3	1	0.160	480	-	-	-	37	57	0	-

⑩ Helium concentration in field screened samples is less than 5% of minimum concentration in the shroud? [X] Yes [ ] No **Note:** 1% helium = 10,000 ppm_v

⑪ Shut in test prior to sample collection completed? Yes [X] No [ ]

⑫ Sample Collection

Date	Time	Sample ID	Summa Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum (in. Hg)	Final Vacuum (in. Hg)
4/1/2011	1035-	260407-19-SS1	934	0496	-	-29.13	
4/1/2011	1035-	BD04-0401 2011	1615	0496	-	-29.98	
-	-	-	-	-	-	-	-

Comments:

SOIL GAS PROBE MEASUREMENTS

Geosyntec consultants

① Project Name: Wells G & H
Date: 4/1/2011 Project Number: B2e200
Site Location: Woburn
Weather: Raw Cold 35
Field Personnel: C. Sullivan, S. Bardsley
Recorded By: C. Sullivan

Probe No.: ~~SS~~ SB 260407-22-SS1 ☒ Sub-slab probe ☐ Soil gas probe
Mini Rae 2000 Serial No.: N/A Lamp: 10.6 / 11.7 eV
Landtech GEM 2000 Landfill Gas Meter Serial No. M: N/A
MDG 2002 Helium detector Serial No.: 08228
Tracer Gas: ☒ Helium ☐ Other 1,1-DFP

② Surface Type: ☐ Asphalt ☒ Concrete ☐ Grass ☐ Other_____
Surface Thickness 5 (inches) centimeters ☐ Unknown
(i.e., asphalt or concrete)

③ Casing Volume
☐ Sub-slab <0.1 L
Soil gas probe .05 (L)

⑤ Shut in test prior to pneumatic test completed, 52 in. H_2O held for 60 seconds.

⑥ Start of Pneumatic Test: N/A

Elapsed Time (min.)	Pump Flow Rate (LPM)	Well Head Vacuum in. H_2O
–	0.1	–
–	0.2	–
–	0.5	–
–		–

④ Initial Vacuum (prior to pumping) 0.015 in. H_2O

⑦ Field tubing blank reading (ppm_v) completed? ☐ Yes ☒ No PID Reading N/A ppm_v

⑧ Shut in test prior to purging completed? Yes ☒ No ☐

⑨ Purging

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L)	Purge Rate (LPM)	Cumulative Volume (L)	CH_4 (%)	CO_2 (%)	O_2 (%)	Tracer Gas Shroud (%) Min	Tracer Gas Shroud (%) Max	Tracer Gas Sample (~~ppm~~ %) (circle one)	VOCs by PID (ppm_v)
4/1/2011	1302	1309	2.5	1	160	400	–	–	–	37.0	45.2	0	–

⑩ Helium concentration in field screened samples is less than 5% of minimum concentration in the shroud? ☒ Yes ☐ No
Note: 1% helium = 10,000 ppm_v

⑪ Shut in test prior to sample collection completed? Yes ☒ No ☐

⑫ Sample Collection

Date	Time	Sample ID	Summa Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum (in. Hg)	Final Vacuum (in. Hg)
4/1/2011	1311-1359	260407-22-SS01	744	0061	–	-29.14	-4.43

Comments:

SOP measurements - pneumatic testing.ai

SOIL GAS PROBE MEASUREMENTS

Geosyntec consultants

① Project Name: WR Grace VI Assessment
Date: 1 April 2011 Project Number: BR0200
Site Location: 260407-22
Weather: See DFR
Field Personnel: SWB/CAS/TC
Recorded By: SWB

Probe No.: 260407-22-SS2 ☐ Sub-slab probe ☐ Soil gas probe
Mini Rae 2000 Serial No.: N/A Lamp: 10.6 / 11.7 eV
Landtech GEM 2000 Landfill Gas Meter Serial No. M: N/A
MDG 2002 Helium detector Serial No.: PING: 08228
Tracer Gas: ☒ Helium ☐ Other UHP

② Surface Type: ☐ Asphalt ☒ Concrete ☐ Grass ☐ Other_____
Surface Thickness 5 (inches/centimeters) ☐ Unknown
(i.e., asphalt or concrete)

③ 1 Casing Volume
☐ Sub-slab
i<0.1 L
Soil gas probe 0.4 (L)

⑤ Shut in test prior to pneumatic test completed, 62 in. H_2O held for 30 seconds.

④ Initial Vacuum (prior to pumping) _____ in. H_2O

⑥ Start of Pneumatic Test: _____

Elapsed Time (min.)	Pump Flow Rate (LPM)	Well Head Vacuum in. H_2O
	0.1	
	0.2	
	0.5	

⑦ Field tubing blank reading (ppm_v) completed? ☐ Yes ☒ No PID Reading — ppm_v

⑧ Shut in test prior to purging completed? Yes ☒ No ☐

⑨ Purging

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L)	Purge Rate (LPM)	Cumulative Volume (L)	CH_4 (%)	CO_2 (%)	O_2 (%)	Tracer Gas Shroud (%) Min	Tracer Gas Shroud (%) Max	Tracer Gas Sample (ppm_v, %) (circle one)	VOCs by PID (ppm_v)
4/1/11	1410	1412	2.5	1	0.160	0.4	–	–	–	28	41	1975	–

⑩ Helium concentration in field screened samples is less than 5% of minimum concentration in the shroud? ☒ Yes ☐ No
Note: 1% helium = 10,000 ppm_v

⑪ Shut in test prior to sample collection completed? Yes ☒ No ☐

⑫ Sample Collection

Date	Time	Sample ID	Summa Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum (in. Hg)	Final Vacuum (in. Hg)
4/1/2011	1418	260407-22-SS2	782	0304	–	-28.42	

Comments:

SGE measurements - pneumatic testing of

AIR ANALYSIS

CHAIN OF CUSTODY

PAGE 1 OF 2

Date Rec'd in Lab:

ALPHA Job #: L1104363

ALPHA ANALYTICAL
320 Forbes Blvd, Mansfield, MA 02048
TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: Geosyntec Consultants
Address: 289 Great Rd, Ste 105
Acton, MA 01720
Phone: (978) 263-9588
Fax: (978) 263-9594
Email: tcreamer@geosyntec.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: WR Grace VI Assessment
Project Location: BR0200
Project #: Woburn, MA
Project Manager: Todd Creamer
ALPHA Quote #:

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due: Time:

Report Information - Data Deliverables

☐ FAX
☒ ADEx
Criteria Checker: TBD
(Default based on Regulatory Criteria Indicated)
Other Formats:
☒ EMAIL (standard pdf report)
☐ Additional Deliverables:
Report to: (if different than Project Manager)

Billing Information

☒ Same as Client info PO #: BR0200

Regulatory Requirements/Report Limits

State/Fed	Program	Criteria
See QAPP		

Other Project Specific Requirements/Comments:

ANALYSIS: TO-14A by TO-15; ~~TO-15~~ acetone ethyl acetate; TO-15 SIM; APH; FIXED GASES; TO-13A; TO-4 / TO-10 — ANC.

All Columns Below Must Be Filled Out

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Start Time	End Time	Initial Vacuum	Final Vacuum	Sample Matrix*	Sampler's Initials	Can Size	I D Can	I D - Flow Controller	TO-14A by TO-15	~~TO-15~~ acetone ethyl acetate	TO-15 SIM	APH	FIXED GASES	TO-13A	TO-4 / TO-10	Sample Comments (i.e. PID)
-1	260407-OA1	3/31/11	0949	1807	-29.79	-7.91	AA	SWB	6L	634	0464		X	X	X				
-2	260407-OA2	3/31/11	0950	1805	-29.73	-2.20	AA	SWB	6L	1052	0112		X	X	X				
-3	260407-17-IA1	3/31/11	1010	1752	-29.72	-6.53	AA	SWB	6L	688	0335		X	X	X				
-4	260407-22-IA1	3/31/11	1021	1757	-29.60	-6.17	AA	SWB	6L	1592	0029		X	X	X				
-5	260407-22-IA2	3/31/11	1025	1800	-29.57	-3.21	AA	SWB	6L	992	0256		X	X	X				
-6	260407-20-IA1	3/31/11	1015	1750	-29.80	-6.53	AA	SWB	6L	968	0205		X	X	X				
-7	260407-19-IA1	3/31/11	0957	1742	-29.68	-3.95	AA	SWB	6L	642	0065		X	X	X				
-8	260407-17-SS1	3/31/11	2118	2215	-29.57	-1.22	SV	SWB	6L	596	0426		X	X	X				
-9	260407-22-SS1	4/1/11	1311	1350	-29.14	-4.43	SV	SWB	6L	744	0061		X	X	X				
-10	260407-22-SS2	4/1/11	1418	1451	-28.42	-3.58	SV	SWB	6L	782	0304		X	X	X				

*SAMPLE MATRIX CODES
AA = Ambient Air (Indoor/Outdoor)
SV = Soil Vapor/Landfill Gas/SVE
Other = Please Specify

Container Type

Relinquished By:	Date/Time	Received By:	Date/Time:
[signature]	4/2/2011 1150	[signature]	4-4-11 1135
[signature]	4/4/11 1330	[signature]	4/4/11 1330

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

AIR ANALYSIS

CHAIN OF CUSTODY

PAGE 2 OF 2

Date Rec'd in Lab:

ALPHA Job #: L1104363

ALPHA ANALYTICAL
320 Forbes Blvd, Mansfield, MA 02048
TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: Geosyntec Consultants
Address: 289 Great Rd, Ste 105
Acton, MA 01720
Phone: (978) 263-9588
Fax: (978) 263-9594
Email: tcreamer@geosyntec.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: WR Grace VI Assessment
Project Location: Woburn, MA
Project #: B20200
Project Manager: Todd Creamer
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due: Time:

Report Information - Data Deliverables

☐ FAX
☒ ADEx
Criteria Checker: TBD
(Default based on Regulatory Criteria Indicated)
Other Formats:
☒ EMAIL (standard pdf report)
☐ Additional Deliverables:
Report to: (if different than Project Manager)

Billing Information

☒ Same as Client info PO #: B20200

Regulatory Requirements/Report Limits

State/Fed	Program	Criteria
See QAPP		

Other Project Specific Requirements/Comments:

All Columns Below Must Be Filled Out

ANALYSIS: TO-14A by TO-15; ~~TO-15~~ (Also: acetone, ethyl acetate); TO-15 SIM; APH; FIXED GASES; TO-13A; TO-4 / TO-10

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Start Time	End Time	Initial Vacuum	Final Vacuum	Sample Matrix*	Sampler's Initials	Can Size	I D Can	I D - Flow Controller	TO-14A by TO-15	~~TO-15~~	TO-15 SIM	APH	FIXED GASES	TO-13A	TO-4 / TO-10	Sample Comments (i.e. PID)
-11	260407-20-SS1	3/31/11	1918	1954	-29.64	-3.61	SV	SWB	6L	1619	070		X	X	X				
-12	260407-19-SS1	4/1/11	1035	1142	-29.13	-4.32	SV	SWB	6L	984	0496		X	X	X				
-13	BD03-03312011	3/31/11	–	–	-29.64	-1.38	SV	SWB	6L	1646	tee		X	X	X				
-14	BD04-04012011	4/1/11	–	–	-29.98	-4.44	SV	SWB	6L	1615	tee		X	X	X				
-15	TB02-04012011	4/1/11	–	–	–	–	–	SWB	6L	609	–		X	X	X				

SWB 4/1/11

*SAMPLE MATRIX CODES
AA = Ambient Air (Indoor/Outdoor)
SV = Soil Vapor/Landfill Gas/SVE
Other = Please Specify

Container Type

Relinquished By:	Date/Time	Received By:	Date/Time:
[signature]	4/2/2011 1150	[signature]	4/4/11 1153
Pat Alder [signature]	4/4/11 1330	[signature]	4/4/11 1330

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions.
See reverse side.

Form No: 101-02 (19-Jun-09)